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ICMPA9 • International Conference on Managing Pavement Assets

Pavement Management's Role in an Asset Management World

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AASHTO THE VOICE OF TRANSPORTATION

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TRB

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WORLD ROAD ASSOCIATION MONDIALE DE LA ROUTE 1909-2009 AIPCR PIARC

VDOT Virginia Department of Transportation

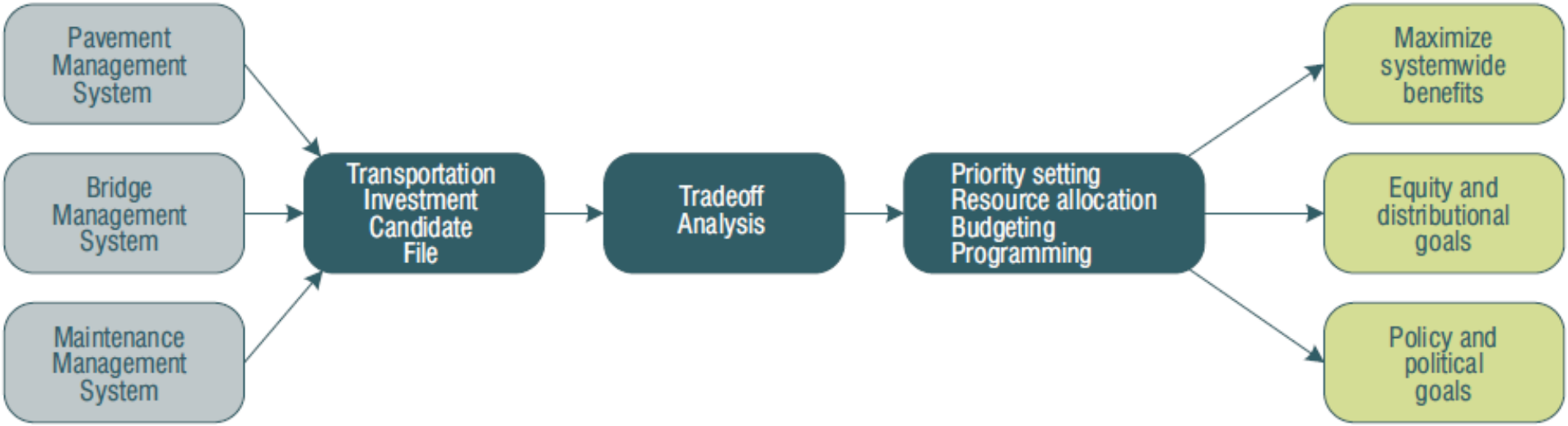
Background

- **Increased attention on asset management with passage of MAP-21**
- **With focus on asset management, is pavement management less important?**
- **Is there a future for pavement management beyond data collection?**

Expanding Role of Pavement Management

- Network-level life-cycle cost analysis
- Cross-asset investment trade-off analysis
- Managing risks impacting agency's strategic goals and objectives
- Integrating pavement management data with other asset data

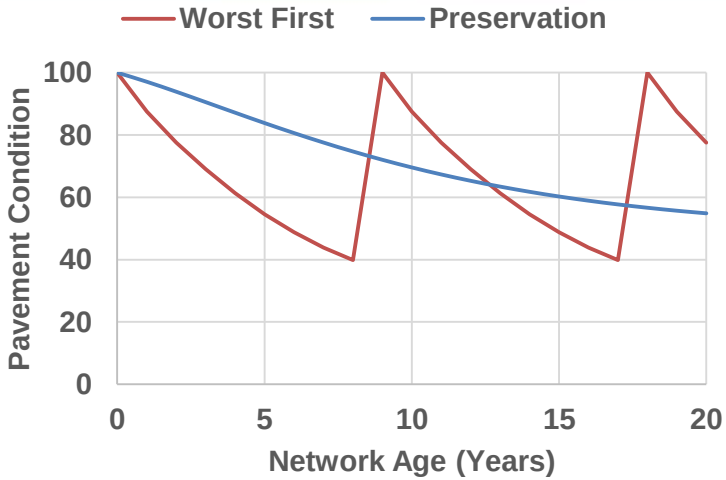
Using Pavement Management to Support Transportation Asset Management Activities

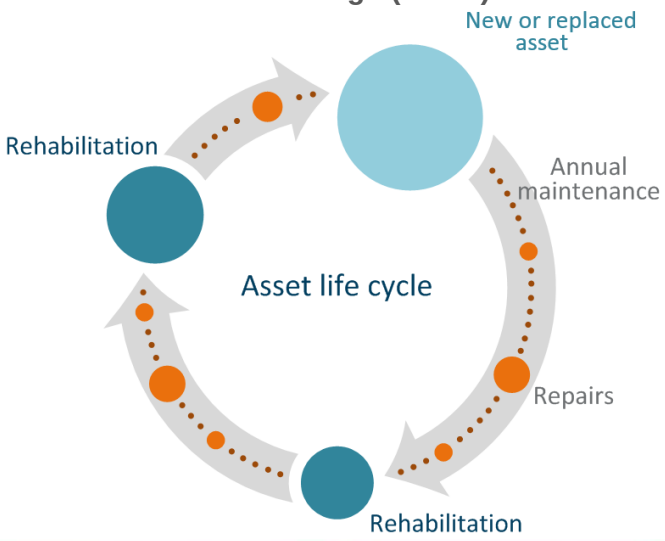


(AASHTO 2011)

Pavement Life Cycle Management

- Describe life cycle costs and explain their importance
- Model typical deterioration trends
- Develop whole-life management strategies
- Document life cycle costs

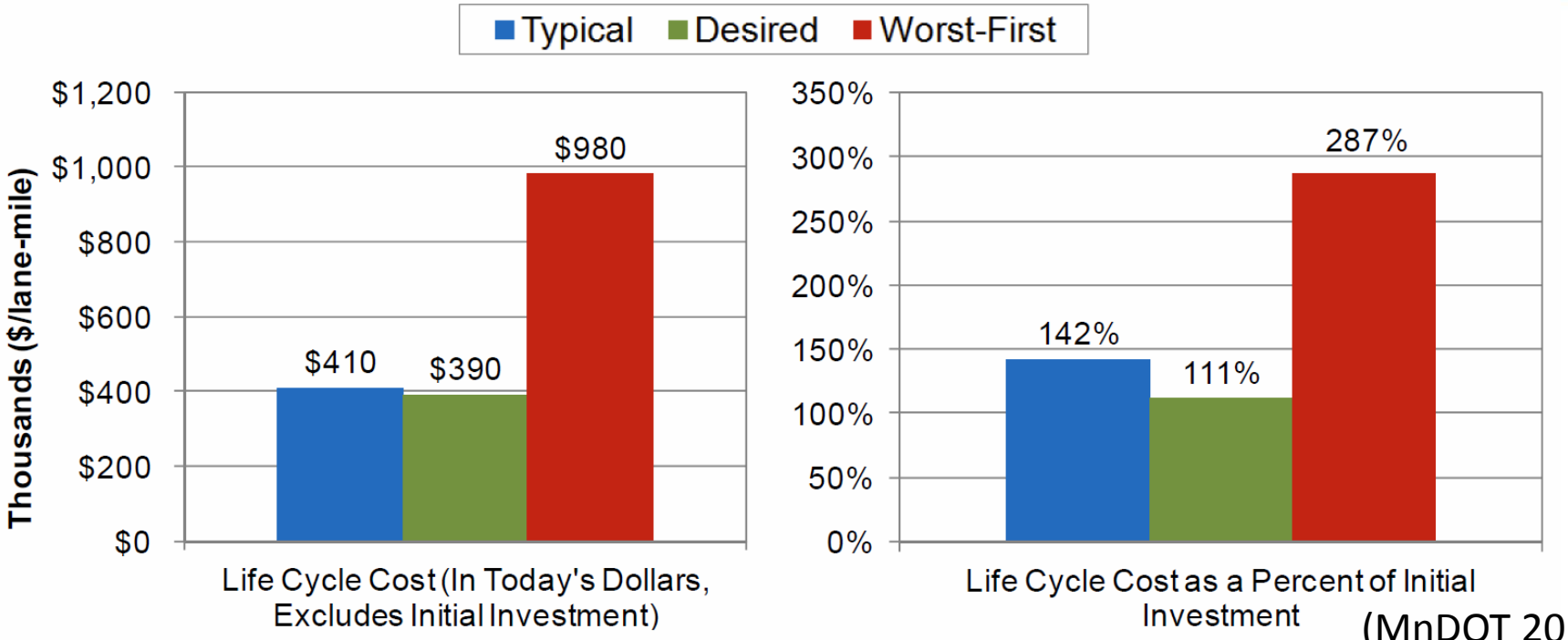




Example Case Study: MnDOT

- Three life-cycle strategies compared:
  - **Worst-First**: No preventive maintenance, major rehab/reconstruction after 25-30 years
  - **Typical**: Reflects current practices of routine mill and overlays with crack sealing and surface treatments in-between
  - **Desired**: Improved end-of-life strategies, using treatments such as full-depth restoration in-lieu of repeated mill and overlays

Example Cast Study: MnDOT (cont'd)

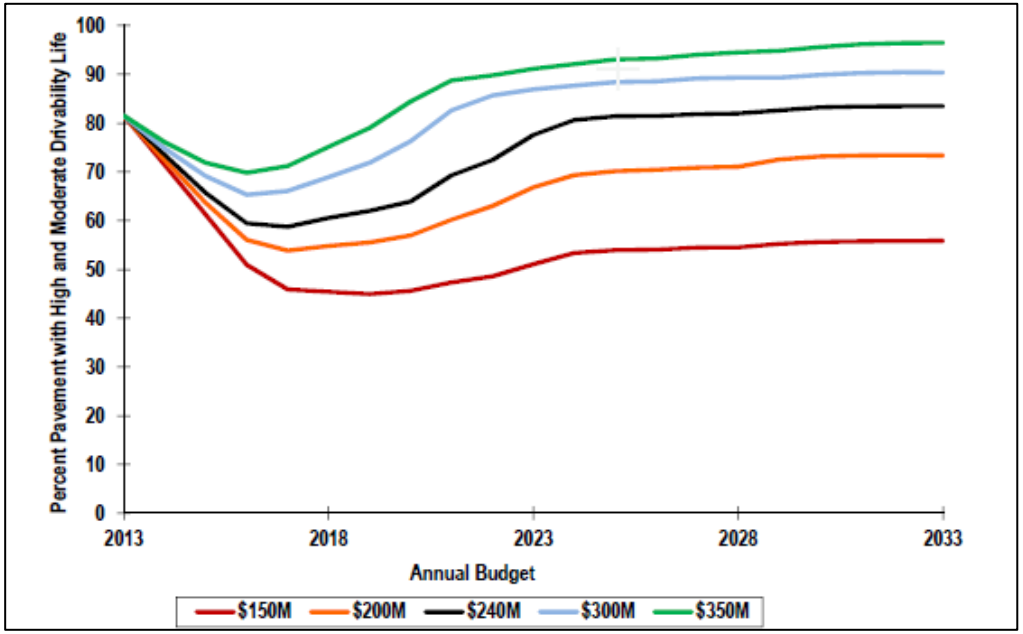


(MnDOT 2014)

- Agency's current policy saves approximately $17 Billion when compared to the worst-first strategy (over entire inventory)
- The desired strategy will result in savings of approximately $600 million over the current strategy (over entire inventory)

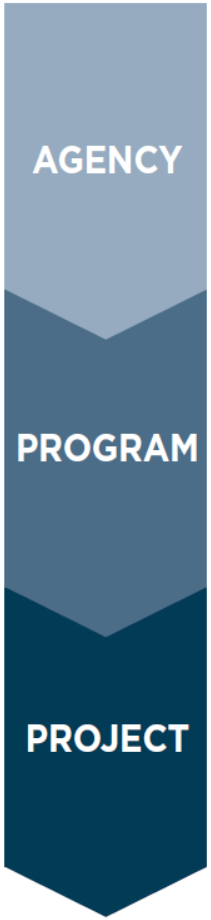
Investment Scenario Development

- Typical analysis focus only on pavements to develop a capital program
- Asset Management Plan requires 10-year investment strategies linked to performance targets
- Account for investment needs for other assets



(CDOT 2014)

Risk Management



RESPONSIBILITY: Executives

TYPE: Risks that impact achievement of agency goals and objectives and involve multiple functions

STRATEGIES: Manage risks in a way that optimizes the success of the organization rather than the success of a single business unit or project.

RESPONSIBILITY: Program managers

TYPE: Risks that are common to clusters of projects, programs, or entire business units

STRATEGIES: Set program contingency funds; allocate resources to projects consistently to optimize the outcomes of the program as opposed to solely projects.

RESPONSIBILITY: Project managers

TYPE: Risks that are specific to individual projects

STRATEGIES: Use advanced analysis techniques, contingency planning, and consistent risk mitigation strategies with the perspective that risks are managed in projects.

(FHWA 2012)

Risk Management: Sample Risk Register

Hazard	Cause(s)	Impact(s)	Likelihood	Consequence Scores					
				Econ. Impct.	Legal	Public Exp.	Safety	Reput	Env.
Lack of or Deferred Funding	Change in federal funding or reduction in fuel tax revenue	Reduction in available funding, reduction present pavement program	5	4	1	2	2	3	1
Volatility in Prices (Inflation)	Political or economic changes, or natural inflation	Reduction in available funding, reduction present pavement program	3	4	1	2	2	3	1

Likelihood & Consequence Ratings

Ranking	Likelihood	Consequence	Score
Very High or Almost Certain	Near Certainty (90%) or likely to occur within the year	Catastrophic Impact on System Performance	5
High or Likely	Highly Likely (70%) or likely to occur within 2 years	High/Large Impact on System Performance	4
Moderate	Likely (50%) or likely to occur within 3 to 5 years	Moderate/Noticeable Impacts on System Performance	3
Low or Unlikely	Unlikely (20-30%) or likely to occur within 6 to 10 years	Low/Some Noticeable Impacts on System Performance	2
Very Low or Rare	Remote (10%) or not likely to occur for 10 or more years	Insignificant/Little Noticeable Impacts on System Performance	1

Enhancements to Support Asset Management Activities

- Integrate asset data
- Develop asset register
- Improve performance modeling
- Capture maintenance costs
- Analyze trade-offs across asset classes
- Evaluate and manage risks

Concluding Remarks

- Pavement management tools serve as basis for making investment priorities and decisions
- Use of pavement management systems is evolving
- Recognize enhancements needed to support other asset management activities to ensure viability and long-term sustainability

Thank You!

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